*Research Letter: Epidemiology*

# Animal companionship and risk of suicide

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## Introduction

It has recently been advanced that animal companionship confers protection against leading causes of death, such as cardiovascular disease, potentially via the weight control associated with the ownership of pets whose care requires physical exertion.[1] By means of other mechanisms, there are also reasons to anticipate that pet ownership may have an impact on other important health outcomes such as suicide, another major cause of premature mortality particularly in people under 50 years of age.[2] Thus, human–animal interaction appears to have a favourable impact on selected risk factors for suicide, including interpersonal interactions, mood, anxiety, positive attention from others, and stimulation of social behaviour.[3] The benefits of animal contact also seem to extend to biomarkers of psychosocial stress, such as lower levels of cortisol, heart rate, and blood pressure.[3] Despite this circumstantial evidence, to the best of our knowledge, there has been no prospective examination of the link, if any, between animal companionship and suicide.

## Methods

Data were taken from the 1995-1997, 2001, 2002 and 2004 Health Surveys for England, a series of independent, UK-representative, near-identical surveys of individuals living in private households.[4] Ethical approval for each survey was granted by local Research Ethics Committees, and study members provided informed consent.

Study members were asked "Do you keep any household pets inside your house/flat?", followed by enquiries about specific pets (dog, cat, bird, other furry pet, or 'other' pet). Owing to a low prevalence of ownership in the latter three groups, these data were collapsed. The following covariates were utilised, all of which were self-reported: age on leaving full time education (categorised as: ≥ age 19/currently in education, age 17-18, age 16, and <age 16), mental health problems (self-reported mental health problems and/or use of psychotropic medication), cigarette smoking (non-smoker, current smoker), somatic illness (one or more of the following physician

diagnoses: neoplasms, diabetes, other endocrine disorders, cerebrovascular disease, myocardial infarction, angina, hypertension, any other heart disease, or respiratory disease), and marital status (married/cohabiting, other). As previously,[5;6] suicide mortality was ascertained by linkage of cohort members to national cause-of-death registers until 14th February 2011 (ICD codes in table footnote).

**Results**

A maximum duration of 17.1 years of follow-up (median 10.4 years) gave rise to 47 deaths ascribed to suicide in an analytical sample of 67,441 which comprised people with data on pet ownership, covariates, and mortality. There was no clear relation between pet ownership and baseline covariates (eTable 1). Of these covariates, being male, having a more basic education, mental health problems, cigarette smoking, and not being married or cohabiting were related to an elevated rate of suicide death (eTable 2).

In the main analyses, after basic adjustment, there was essentially no suggestion that animal companionship was related to suicide risk (Table 1). Disaggregating into the type of pet owned did not alter these conclusions. After adjustment for a range of covariates which included socioeconomic status and marital support, there remained no link between different types of animal companionship and suicide risk.

**Discussion**

Despite the reasonable *prima facie* case for a link between animal companionship and risk of suicide, we found no strong evidence in the first longitudinal study used to examine this association. That we were also able to reproduce known risk factors for suicide (gender, smoking, mental health, marital status[7]) gives us some confidence in our novel findings for pet ownership. Our results accord with the only other investigation of which we are aware.[8] In that census-based case-control

study, the presence of any animal on a property was recorded, many of which would have been for the purpose of farming rather than companionship.

**Author contributions:** Study concept and design: both authors; Statistical analysis: SB; Interpretation of the data: both authors; Drafting of the manuscript: GDB; Critical revision of the manuscript for additional intellectual content: both authors. SB had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Both authors read, edited, and agreed on the final manuscript as well as the decision to submit for publication.

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**Table 1. Hazard ratios (95% confidence interval) for the association of type of pet ownership with suicide mortality: pooling of raw data from six UK general population-based longitudinal studies**

| | No. of suicides | No. at risk | Age- and Sex-adjustment | Multiple-adjustment |
|---|---|---|---|---|
| | | | | |
| No pet | 25 | 36376 | 1.0 (ref) | 1.0 (ref) |
| Dog | 15 | 15434 | 1.3 (0.7, 2.5) | 1.3 (0.7, 2.6) |
| Cat | 2 | 10737 | 0.3 (0.1, 1.1) | 0.3 (0.1, 1.1) |
| Other pet | 5 | 4894 | 1.4 (0.5, 3.7) | 1.5 (0.6, 3.9) |
| Any pet | 22 | 31065 | 1.0 (0.5, 1.7) | 1.0 (0.5, 1.7) |
| | | | | |

[a]Multivariable adjustment is adjustment for: age, sex, plus age on leaving full time education, mental health problems, cigarette smoking, somatic illness, and marital status.

Suicide mortality was denoted by any mention of the following events on death certificates (international classification of diseases (ICD) 9th and 10th revisions): ICD-9 suicide and self-inflicted poisoning by solid or liquid substances (E950-E959) and injury undetermined whether accidentally or purposely inflicted (E980-E989), and ICD-10 terrorism (U03.1 and U03.9), intentional self-harm (X60-X84), event of undetermined intent (Y10-Y34), sequelae of intentional self-harm, assault and events of undetermined intent (Y87), and sequelae of unspecified external cause (Y89.9).